

## REMARKS

### Status of the Claims

Claims 1, 2, 4-8, 13, 15, 16, 18, and 19 are currently pending in the present application. In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

### Issues under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-2, 4-8, 13, 15-16, and 18-19 under 35 U.S.C. § 103(a) as being unpatentable over Kobayashi et al. '073 (US 6,054,073) in view of Anzai et al '520 (US 4,923,520). Applicants respectfully traverse. Reconsideration and withdrawal of this rejection are respectfully requested based on the following considerations.

### Legal Standard for Determining Prima Facie Obviousness

MPEP 2141 sets forth the guidelines in determining obviousness. First, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), which has provided the controlling framework for an obviousness analysis. The four *Graham* factors are:

- (a) determining the scope and content of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating any evidence of secondary considerations.

*Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

Second, the Examiner has to provide some rationale for determining obviousness. MPEP 2143 sets forth some rationales that were established in the recent decision of *KSR International Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

As the MPEP directs, all claim limitations must be considered in view of the cited prior art in order to establish a *prima facie* case of obviousness. See MPEP 2143.03.

*Distinctions Over the Cited References*

Enclosed herewith is a 37 CFR § 1.132 Declaration of Mikio Sakaguchi, one of the present inventors. The Examiner is respectfully requested to review the enclosed Declaration of Mikio Sakaguchi as it provides strong evidence of the patentability of the present invention.

In the enclosed Declaration, additional test data, as shown in Comparative Example 4, are set forth. Comparative Example 4 is equivalent to the examples of Kobayashi et al. '073. Comparative Example 4 was evaluated in the same manner as the examples of the present specification. However, Comparative Example 4 contains only SiO<sub>2</sub>. When comparing pulverization resistance, the present invention is unexpectedly superior. Comparative Example 4 strongly evidences that the cited references do not produce the results of the present invention.

Relevant to this § 103(a) rejection, *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966) has provided the controlling framework for an obviousness analysis, wherein a proper analysis under § 103(a) requires consideration of the four *Graham* factors. One such factor includes the evaluation of any evidence of secondary considerations (e.g., commercial success; unexpected results). 383 U.S. at 17, 148 USPQ at 467. In this regard, Applicants respectfully submit that the present invention has achieved unexpected results, whereby such results rebut any asserted *prima facie* case of obviousness. See *In re Corkill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). Also, the comparative showing need not compare the claimed invention with all of the cited prior art, but only with the closest prior art. See MPEP 716.02(b) and 716.02(e).

According to MPEP 2145, rebuttal evidence and arguments can be presented by way of a declaration under 37 CFR 1.132, *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995). Office personnel should consider all rebuttal arguments and evidence presented by Applicants. See, e.g., *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (“[Rebuttal evidence] may relate to any of the *Graham* factors including the so-called secondary considerations.”). Rebuttal evidence may also include evidence that the claimed invention yields unexpectedly improved properties or properties not present in the prior art. Rebuttal evidence may consist of a showing that the claimed compound possesses unexpected properties. *In re Dillon*, 919 F.2d 688, 692-93, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990).

Thus, due to the unexpected results as achieved by the present invention, the rejection has been overcome. Reconsideration and withdrawal of this rejection are respectfully requested.

Moreover, the Examiner admits that Kobayashi et al. '073 do not disclose the claimed water absorption. However, the Examiner relies on Anzai et al. '520 to overcome this deficiency. The Examiner alleges that a water absorption of 0.21% is disclosed in Anzai et al. '520 so that one of ordinary skill in the art would find it obvious to modify Kobayashi et al. '073 to the claimed range of the present invention. Applicants respectfully traverse.

The water absorption shown in Table 3 of Anzai et al. '520 is a value for a plate-like test piece prepared from a resin, a curing agent, and a spherical fused silica. Anzai et al. '520 do not show any values for the water absorption of the spherical fused silica itself. The water absorption of Anzai et al. '520 is greatly influenced by the material or shape of the plate-like test pieces (e.g., the kinds of resins and the conditions for curing, etc.), and thus, the skilled artisan would not recognize any importance with respect to the water absorption of the spherical fused silica.

Moreover, it is not obvious that water absorption is preferably at most 0.8% by weight from the viewpoint of suppressing the increase in binder amount due to the absorption of a binder used in the production of a mold into molding sands and improving the mold strength as described in the present specification (page 7, lines 21-25). Thus, the cited references do not disclose the claimed water absorption range of the present invention.

Turning to the claimed spherical degree, the Examiner admits that this limitation is not disclosed by Kobayashi et al. '073. The Examiner again relies on Anzai et al. '520 to overcome this deficiency. The Examiner alleges that Anzai et al. '520 disclose a spherical degree of 0.99 or more so that it would be obvious for one of ordinary skill in the art to modify Kobayashi et al. '073 within the claimed range of the present invention. Applicants respectfully traverse.

Anzai et al. '520 recite, "Close observation by a light microscope reveals that more than 99 percent are in perfect spherical form with a high degree of transparency" (col. 4, lines 20-23). To clarify, the original Japanese specification recites that "it can be seen from close observation with a light microscope that more than 99 percent of the particles are in perfectly spherical shape having a high degree of transparency."

In other words, 99 percent refers to the number of particles and not the spherical degree. Thus, the cited references do not disclose the claimed spherical degree of the present invention, and this rejection has been overcome for this reason above.

With respect to the claimed weight ratios of alumina to silica, the Examiner asserts that these ratios would have been obvious to one of ordinary skill in the art through process optimization. Applicants respectfully traverse as no evidence has been presented for this conclusion. Further, the relevant art of the present invention is unpredictable, and thus, optimization is difficult to obtain. As such, the present invention recites a specific weight ratio range that obtains an unexpected result of excellent regeneration efficiency (page 4, lines 22-24 of the present specification).

As stated in *KSR International Co. v Teleflex Inc.*, 82 USPQ2d 1385, 1396 (2007), “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” Furthermore, the mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *Id.* As described above, Applicants have shown that the present invention achieves unexpected and unpredictable results.

To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be disclosed by the cited references. As discussed above, Kobayashi et al. ‘073 in view of Anzai et al ‘520 fail to disclose all of the claim limitations of independent claim 6, and those claims ultimately dependent thereon. Accordingly, the combination of references does not render the present invention obvious. Furthermore, the cited references or the knowledge in the art provide no reason or rationale that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the outstanding rejection is respectfully requested. Any contentions of the USPTO to the contrary must be reconsidered at present.

**CONCLUSION**

A full and complete response has been made to all issues as cited in the Office Action. Applicants have taken substantial steps in efforts to advance prosecution of the present application. Thus, Applicants respectfully request that a timely Notice of Allowance issue for the present case clearly indicating that each of claims 1-2, 4-8, 13, 15-16, and 18-19 are allowed and patentable under the provisions of title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad M. Rink, Reg. No. 58,258 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

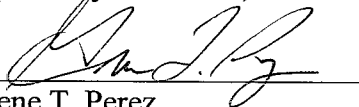
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated:

**JUN 4 2009**

Respectfully submitted,

By



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Attachment: Declaration under 37 C.F.R. § 1.132 of Mikio Sakaguchi